

REMARKS

Claims 1-8 and 12-17 are pending herein.

1. Claim 17 was rejected under 35 U.S.C. 112, second paragraph. Claim 17 has been amended to more clearly recite that at least two substrates are simultaneously being coated. As such, Applicants respectfully request withdrawal of this rejection.

2. Claims 1, 7 and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al. (5,650,378) or Iijima et al. (6,214,772) in combination with Savvides et al. (2004/0168636), Sioshansi et al. (5,236,509) or Maishev et al. (6,236,136) further in combination with Slaughter et al. (6,783,637). Applicants note that the examiner fails to address the rejection of claim 12 and assume the examiner intended to reject claim 12 with reasoning similar to the rejection of claims 1 and 7. This rejection is respectfully traversed for the following reasons.

Claims 1, 7, and 12 are drawn to a method of coating at least one substrate with a buffer layer. The method particularly includes feeding the at least one substrate through a deposition zone of a vacuum deposition chamber wherein a coating is applied while the at least one substrate is bombarded by ions from a dual RF-ion source. The dual RF-ion source includes a first and a second RF-ion sources aimed at respective first and second portions of the at least one substrate. The first and second RF-ion sources are located such that a projection on a major surface of the at least one substrate of a line intersecting the first and second RF-ion sources is substantially perpendicular to the longitudinal axis of the substrate. For clarity, FIG. 4 is reproduced below with the addition of the line intersecting the first and second RF-ion sources and the projection of the line on the major surface of the at least one substrate. The longitudinal axis of the at least one substrate extends out of the page.

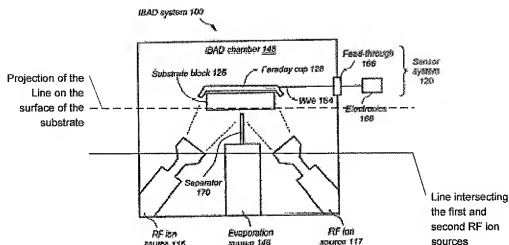


FIG. 4

Additionally, a separator is disposed between the first and second RF-ion source and located in closer proximity to the substrate block than to the dual RF-ion sources. The separator longitudinally bisects the substrate block and functions to barricade impingement of ions from the first RF-ion source on the second portion and from the second RF-ion source of the first portion.

Iijima '378 and Iijima '772 disclose processes for deposition of a buffer on a substrate using a single RF-ion source. Iijima '378 and Iijima '772 fail to recognize the challenges associated with processing at least one substrate using multiple RF-ion sources within a single deposition zone. In particular, Iijima '378 and Iijima '772 fail to recognize the need to prevent stray ions from impinging on the at least one substrate. Savvides discloses a process of using two ion beams impacting the same area of the substrate to improve the texture of the buffer film. As the ion beams of Savvides are intended to impinge on the same area, Savvides fails to teach, suggest, or provide motivation for using a separator to prevent the ion beams from overlapping on the substrate. Sioshansi discloses a modular system for coating a substrate. Specifically, Sioshansi discloses the use of multiple deposition chambers, each having separate RF-ion sources. Sioshansi fails to teach, suggest, or provide motivation for using a separator to prevent the ion beams from overlapping. Maishev discloses multiple ion beams for the

treatment of a substrate. The ion beams overlap so as to ensure uniformity in the distribution of the ion currents. However, Maishev is not directed to ion beam assisted deposition (IBAD), and thus is not concerned with the angle of the ions striking the substrate. As such, Maishev fails to recognize the challenges associated with an IBAD system using multiple ion sources striking separate portions of the deposition zone. Iijima '378, Iijima '772, Savvides, Sioshansi, and Maishev, alone or in combination, fail to recognize the need to prevent stray ions from impacting the substrate when non-overlapping RF-ion sources are used within a deposition zone, and clearly fail to disclose or suggest a coating method incorporating a separator as claimed.

The PTO acknowledges that Iijima '378, Iijima '772, Savvides, Sioshansi, and Maishev fail to teach a separator between the two RF-ion sources. The PTO relies upon Slaughter for disclosure a separator. Slaughter teaches a system in material from two targets is deposited on the same region of a substrate. Referring to FIG. 3 of Slaughter, ion beams 38 and 40 impinge on the targets 50 and 52, causing material from the targets to be ejected and deposited on the substrate 14. A single ion source 97 impinges on the substrate 14. Shields 46 and 48 are placed between two targets, not the RF ion sources, to prevent ejected material from depositing on the targets, not to prevent ions from impinging on portions of the at least one substrate. As such, Slaughter fails to appreciate the need to prevent stray ions from impacting the substrate when non-overlapping RF-ion sources are used within a deposition zone, and further, fails to cure the deficiencies of Iijima '378, Iijima '772, Savvides, Sioshansi, and Maishev. Namely the references, alone or in combination, fail to disclose or suggest a coating method incorporating a separator functioning to barricade impingement of ions from the first RF-ion source on the second portion and barricade impingement of ions from the second RF-ion source on the first portion.

Applicants submit that the PTO's reliance upon Iijima '378, Iijima '772, Savvides, Sioshansi, Maishev, and Slaughter is deficient. Accordingly, withdrawal of the rejections based on Iijima '378, Iijima '772, Savvides, Sioshansi, Maishev, and Slaughter is respectfully requested.

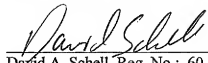
2. Claim 2 and 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al. (5,650,378) or Iijima et al. (6,214,772) in combination with Savvides et al. (2004/0168636), Sioshansi et al. (5,236,509) or Maishev et al. (6,236,136) further in combination with Slaughter et al. (6,783,637) still further in combination with Fritzmeier et al. (6,797,313). Claims 3-6 and 14-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al. (5,650,378) or Iijima et al. (6,214,772) in combination with Savvides et al. (2004/0168636), Sioshansi et al. (5,236,509) or Maishev et al. (6,236,136) further in combination with Slaughter et al. (6,783,637). Applicants respectfully submit the independent claims upon which these claims depend are in allowance. Accordingly, withdrawal of these rejections are respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below. The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

Date 9/30/08


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